APPROACH TO AN ADAPTIVE MANAGEMENT PROGRAM FOR WATER OPERATIONS UNDER THE BDCP

Background

The BDCP conservation strategy sets out a comprehensive set of conservation measures that are designed to meet a range of identified measurable biological goals and objectives. The proposed conservation measures include certain actions to improve flow conditions, increase food production, restore habitat, and reduce the adverse effects of other stressors. The BDCP conservation strategy also recognizes the considerable uncertainty that exists regarding the understanding of the Delta ecosystem and the likely outcomes of implementing the conservation measures, both in terms of the nature and the magnitude of the response of covered species and of ecosystem processes that support the species. To effectively address such uncertainty, the BDCP conservation strategy includes an adaptive management program that provides for flexibility in the implementation of the Plan's conservation actions.

The BDCP adaptive management program is premised on the idea that, as new information and insight are gained during the course of plan implementation, alternative strategies can be employed to respond to uncertainty and advance the biological goals and objectives for the Plan. It is expected that the criteria and targets established for some of the BDCP conservation measures will prove inadequate, while others will produce better results than expected. Through the monitoring program, new data and up-to-date scientific information will provide greater insight and understanding of the capacity of the conservation measures to meet the goals and objectives of the Plan. The adaptive management process will afford the flexibility to allow for substantial changes, additions, and subtractions to be made to the slate of conservation measures to improve the effectiveness of the Plan over time.

As part of the adaptive management program, adjustments to water operations criteria established by the conservation measure for water operations ("CM1") will likely be necessary and advisable. The BDCP will identify the specific water operations parameters that may later be changed, and define the range within which such changes may occur, consistent with regulatory assurances provided for under State and federal law. These adjustments may result in curtailments or expansions of water supply beyond the levels initially established by CM1. The following discussion is focused on a proposed approach to adaptive management related to water operations.

Regulatory Context

The fish and wildlife agencies use adaptive management as a tool to address uncertainty in the conservation of a species covered by a conservation plan. The agencies consider adaptive management strategies to be necessary in cases where the actions proposed in a conservation plan pose a significant risk to species due to uncertainty or significant lack

of data or information. Within certain constraints, permit holders may be required to bear some responsibility for the risks associated with uncertainty and assume obligations beyond those reflected in the conservation measures set out in the plan. These additional obligations are intended to allow for additional steps to be taken to moderate risk to species, increase the likelihood that intended outcomes are achieved (*e.g.*, pursuant to the NCCPA, "assist" in achieving …) and further ensure that permit issuance criteria are satisfied. These adaptive management actions may be triggered if monitoring results or new information indicate that conservation measures are ineffective or that the impacts of the covered activities are more significant than initially anticipated.

The adaptive management obligations of the permit holder should be specifically identified in the conservation plan so that it is clear where the obligations of the permit holders end and where those of the State and federal agencies begin.[1] As such, adaptive responses should include information about the timing or duration of a response, the magnitude or extent of a potential change in a conservation measure, and the circumstances under which such changes will be required. Once these adaptive management actions have been agreed upon, they largely represent the extent of the actions that will be required of the permit holder, consistent with the assurances provisions of the federal No Surprises rule and the NCCPA.

BDCP Adaptive Management Program for Water Operations

Due to the uncertainties surrounding the effect of CVP/SWP water operations on delta aquatic species and their habitats, the adaptive management program for the BDCP will include provisions to allow for adjustments to be made over time to CM1. The range of potential adjustments to CM1 will be defined by the "adaptive limits."

The adaptive limits will serve as a kind of "contingency or insurance fund," from which additional water could be drawn in the event that the BDCP conservation strategy is not succeeding. Conversely, the adaptive limits will serve as means by which potential increases in water supply may be accommodated in the event that the conservation strategy exceeds expectations or that new information reveals that available resources would be better directed toward other types of conservation actions. The BDCP will also identify the circumstances in which the adaptive management program for water operations may be triggered and adaptive changes to CM1 required. A decision-making process will also be set out in the Plan, including a process for the resolution of disputes.

The following describes the steps to be taken in the development of an adaptive management program for water operations and proposes several approaches that may be adopted as part of that program:

[1] To harmonize adaptive management with No Surprises assurances, the federal fish and wildlife agencies require that "[w]henever an adaptive management strategy is used, the approved HCP must outline the agreed-upon future changes to the operating conservation program." [Citation]

Step 1: Approach to Characterizing the Adaptive Limits

An approach to characterizing the adaptive limits will need to be identified. That is, the adaptive limits will need to be expressed in terms of some measure of operational change. There appears to be a number of ways to do this. Some have suggested that limits be developed for each of the key operational parameters (of which there may be as many as 13);[2] some have suggested that distinct "packages" of operational scenarios (such as the parameters set by existing biological opinions or D-1641) be used to create the range of potential adaptive management changes; others have proposed that the adaptive limits be described as a single, defined quantity of water (for each end of the limits) that would be available for adaptive management actions.

A defined quantity of water that establishes the sideboards of the adaptive limits offers a number of advantages over other approaches. First, it is based on a straightforward and understandable concept, providing for a clear, unequivocal metric for the total amount of additional water (in acre feet) that would be available for adaptive changes to water operations. Moreover, it would also simplify the process of implementing the adaptive management program, allowing for flexibility in determining the most effective adjustments to operational parameters in light of particular circumstances. The approach would further offer advantages during plan implementation in terms of accounting, measuring, and tracking (which would be measured through the use of supply reliability curves) those actions taken pursuant to the adaptive management program.

The parameter-by-parameter approach, on the other hand, would add to the complexity of adaptive management decision-making and implementation, and reduce options for flexible and creative adaptive responses. The approach would first require a determination of which operational components would benefit from future adaptive management changes, which would assume that a degree of scientific consensus could be reached on the question. In the event that the appropriate parameters could be identified, judgments would need to be made regarding whether potential changes to those parameters ought to extend in one or both directions (which would affect the available water supply). Some of the components, for instance, would be subject to adaptive changes involving greater supply constraints, others to lesser constraints, and some to both. The approach, however, assumes a level of scientific precision – that the specific operational parameters and the range of potential changes that may be sought for each can be currently identified, notwithstanding the uncertain state of science and the changing Delta ecosystem. Such precision is likely not available or even desirable.

Step 2: Approach to Setting the Adaptive Limits

Once the approach to characterizing the adaptive limits has been identified, the boundaries of the range of operational changes that would be permissible pursuant to the adaptive management program would need to be established. The defined limits would reflect the extent to which criteria set out in CM1 may be adjusted as circumstances

[2] See Table 3-13, BDCP Chapter 3, November 18, 2010 draft.

warranted over time. Such adjustments made within the defined range would translate into additional reductions or increases to water supplies.

As part of the process to determine appropriate sideboards, the parties should assess, among other things, the potential implications of such adaptive changes to both water supply and fish species covered by the BDCP. The ultimate range would need to reflect a balance between these dual goals of the BDCP. Among other things, the water agencies would need to determine the extent to which additional commitments of water for conservation purposes is practicable. The fish agencies would need to consider the beneficial biological signals that would likely result from changes made to the water operations conservation measures.

The determination of the extent to which operational changes may be made through adaptive management – that is, the total quantity of water that would be available – should be guided by certain principles. These principles reflect the policy and regulatory considerations that have been deemed important to the success of the BDCP. They include the following:

- The adaptive limits should be compatible with the dual goals of the BDCP of enhancing and restoring the ecological functions of the Delta and improving water supplies and the reliability of the delivery of water supplies.

- The extent of the adaptive limits should reflect the level of scientific uncertainty that currently exists with respect to aquatic species and their habitats.

- The adaptive limits should be sufficient to allow for operational changes that "assist" in achieving the BDCP biological goals and objectives; the range should not be so broad as to encompass all operational changes that could conceivably be thought necessary to ensure that such goals and objectives are met.

- The adaptive limits should provide for only those operational changes that are practicable and that are roughly proportional to the impacts of the covered activities.

- The range should not be so broad so as to render regulatory assurances meaningless.

Step 3: Approach to Changing Water Operations within the Adaptive Limits

Once the adaptive limits have been established for water operations, the process and guidelines for making adaptive management changes should be developed. These processes and guidelines should address both the conditions that would be necessary to trigger the adaptive management process and those that would be required to justify the adoption of a change in water operations criteria.

There are several possible approaches that could be considered, some more process-oriented and others based more on decision rules and detailed prescriptions. The most practicable approach, however, would involve a defined decision-making process that would be guided by broad principles outlining the circumstances under which the adaptive management process may be invoked and the limitations on the nature and magnitude of any resulting change. Under this approach, the development of procedural steps and substantive constraints would take into account the following principles:

- The totality of the circumstances in which adaptive responses would be appropriate should be defined. Factors that should be incorporated into the decision rules include: 1) substantial progress toward biological goals and objectives is not being achieved; 2) new information becomes available that suggests that BDCP water operations are having a greater effect on species than initially anticipated; 3) a changed circumstance has occurred that necessitates modifications to water operations.

- Indicators of lack of progress toward meeting goals and objectives or greater impact of water operations on covered species (*e.g.*, measures/metrics identified in biological goals and objectives) should be identified.

- The adaptive limits should encompass only those actions that are reasonably likely to produce beneficial biological signals.

- Sufficient causal links should be established between BDCP covered activities and biological decline or adverse effect must be demonstrated, to the extent feasible (*e.g.*, substantial factor test).

- Proposed operational adaptive responses must be commensurate with the newly-determined incremental impact or the incremental decline attributable to water operations (may include a determination that the proposed operational change within the adaptive range is practicable).

- Guidelines should be incorporated to assess "cost-benefit" of a potential adaptive change so that resources are maximized. For instance, certain changes may result in minimal impacts to water supply, but produce substantial biological benefits and vice versa.

- Guidelines should be adopted that require that decisions to change CM1 must include explain the reasons why non-operational responses would not be sufficient, such as through additional habitat restoration actions.

Step 4. Approach to Decision-making and Dispute Resolution

The BDCP governance structure should include a well-defined framework for adaptive management decision-making. The Plan should set out the roles and responsibilities of

the Implementation Board, the Permit Oversight Group, Implementation Office, and the other relevant parties as they relate to the various aspects of the adaptive management program, and clearly define the process by which such decisions will be made. The Plan should further describe the steps that would be taken to resolve disputes that may arise in connection with adaptive changes to water operations criteria.

The following proposes a process and approach to adaptive management decisions that affect water operations. This approach could potentially extend to other aspects of the adaptive management program as well.[3]

1. Proposals to Trigger the Adaptive Management Process.[4] All proposals to initiate the adaptive management process for water operations would be submitted to the Program Manager. Proposals could be forwarded by any interested party, including the Authorized Entities, the fish and wildlife agencies, stakeholders and others. The Science Manager, through the Program Manager, could also propose that the adaptive management process be initiated.

The Program Manager would refer all such proposals to the Science Manager and the Adaptive Management Team (which would consist of scientists from the IEP, water agencies, and stakeholder groups). The Adaptive Management Team, after review of the proposal and after receiving input from the Authorized Entities, the fish and wildlife agencies, and the Stakeholder Council, would recommend to the Implementation Board and the Permit Oversight Group whether the adaptive management process should be triggered.

2. Consideration of the Adaptive Management Team Recommendations.

The Implementation Board and the Permit Oversight Group would convene to consider the recommendation of the Adaptive Management Team. As part of their deliberations, the Implementation Board and Permit Oversight Group could jointly seek input from independent scientists. If the Implementation Board and Permit Oversight Group agreed that a proposal warranted consideration in the adaptive management process, the proposal would be referred, through the Science Manager, to the Adaptive Management Team for further assessment. If the Implementation Board and the Permit Oversight Group were unable to reach agreement, the dispute resolution process would be invoked.

3. Process to Determine Appropriate Adaptive Change to Water Operations.

Once a decision was made to invoke the adaptive management process, the Adaptive Management Team would evaluate the proposal and consider potential responses within

[3] A timeframe will need to be developed for each of the proposed steps outlined in this paper.
[4] The adaptive management process for water operations is separate and distinct from "real time" operational changes. Real time operational changes will occur within the criteria established for CM1. Adaptive changes, on the other hand, would involve adjustments to CM1 criteria, within the sideboards of the adaptive limits.

the adaptive limits. The Adaptive Management Team would analyze the scientific and biological variables associated with a potential operational change (including the causal relationship between the BDCP actions and the ecological circumstances at issue). Other considerations, such as policy, legal, and regulatory principles, would be addressed by the Implementation Board and the Permit Oversight Group. The Adaptive Management Team would develop a recommendation that included a description of the proposed operational change, if any, and the scientific justification for such change. The recommendation would also include a discussion of other non-water operations measures that were considered and the reasons why such measures were not being proposed. The Science Manager would submit the recommendation of the team to the Implementation Board and the Permit Oversight Group for its consideration. In the event that the Adaptive Management Team was unable to reach consensus, the Science Manager would report to the Implementation Board and Permit Oversight Group on the nature of the disagreement and the Science Manager's individual judgment regarding the appropriate course of action.

The Implementation Board and the Permit Oversight Group would jointly meet to consider and act on the recommendations of the Adaptive Management Board. As part of these deliberations, the parties would identify and take into account the policy, legal, and regulatory principles established in the BDCP to guide such decisions. In the event that the Implementation Board and the Permit Oversight Group were unable to come to an agreement on the adaptive change to be implemented, the parties would jointly select and convene an independent science panel make separate recommendations. If either the Implementation Board or the Permit Oversight Group were to reject the recommendations of the independent science panel, the dispute resolution process would automatically be triggered.

4. Dispute Resolution Process for Adaptive Changes to Water Operations.

A dispute resolution process would be initiated in circumstances in which the Implementation Board and the Permit Oversight Group were unable to reach agreement 1) on whether the adaptive management process should be initiated on the basis of a proposed action, or 2) on the nature or magnitude of a specific change recommended by the Adaptive Management Team. In such an event, the parties, with the assistance of the Program Manager and the Science Manager, would describe the basis for the dispute and propose options for its resolution. The matter would then be elevated, in an orderly and timely manner, to the highest ranking responsible officials, be it a federal or State cabinet-level official or their designee (i.e., the Departments of Commerce and/or Interior), or the California governor.

If the highest ranking federal and State officials are unable to resolve the issue at hand, the Implementation Board would proceed with the action it deemed appropriate. However, the fish and wildlife agencies would each consider whether such action would be in compliance with the terms and conditions of the BDCP, its Implementing Agreement, and the associated regulatory authorizations.